The Potato News Bulletin

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The Potato Association of America

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POTATO ASSOCIATION OF AMERICA — WHAT IT STANDS FOR AND ITS NEEDS

W. STUART

For the information of the newer members of the Association, as well as for those who contemplate becoming members it has been thought advisable to reprint Article II of the constitution of The Potato Association of America, setting forth the objects of the organization.

"The object of this Association shall be to bring together for mutual co-operation and co-ordination of effort of all individuals interested in the production, transportation, distribution and utilization of potatoes, and the promotion of the potato industry in all its phases.

To create a general interest in better seed, true to name and free from disease.

To stimulate the development of new and improved varieties, possessing greater adaptability to special soil or climatic conditions; a higher starch content, greater productiveness, or marked immunity of vine or tuber to disease.

To provide for the proper description of varieties and the encouragement of registration and nomenclature for new and worthy introductions.

To encourage seed certification through a system of field and bin inspections.

To assist in determining varietal adaptation through uniform varietal tests in all parts of the country.

To encourage the co-ordination of potato investigations by the United States Department of Agriculture, the State Experiment Stations and the Dominion and Provincial Departments of Agriculture in Canada.

To raise the standard of market requirements for table stock through more careful grading and packing, and better eating quality.

To stimulate the investigation of methods for the profitable utilization of surplus and cull potatoes.

To encourage measures designed to safeguard our American industry against the introduction of disease and insect pests.

To encouragement establishment of a more effective system of distribution and marketing.

To promote and establish the true function of potato contests and exhibitions.

To collect and disseminate the best available information relating to both the practical and scientific phases involved in increased yields, coupled with a lessened cost."

It is apparent from the foreging list of objectives that there is scarcely any limit to the possibilities of usefulness of the Potato Association of America. The one thing needful to success is the active participation of each member in the carrying out of the proposed program of work as set forth in Article II. If a suggestion may be permitted, the writer would request your earnest cooperation in the securing of new members. A large membership, if successfully welded together, is bound to exert a greater influence in the putting over of any proposed line of action by the Association than if the membership is small. This is a work in which every member can engage. Additional copies of the November issue of the Potato News Bulletin to be used in soliciting new members will be mailed to you upon receipt of request by the secretary.

Compare the present issue of The Potato News Bulletin with that of November and ask yourself whether it is worth while giving it your hearty support by contributing something to its pages. Let us double its size in January.

All members who can possibly attend the annual meeting of the Association should do so, as many interesting papers are to be presented.

The following titles of papers have been submitted since the publication of the November issue:

Results of Using Various Forms of Sulphur in Potato Scab Control in Kentucky (10 min.)—J. S. Gardner, Exp. Sta., Lexington, Ky.

Some Factors in Storage (10 min.)—Dr. A. T. Evans, Agr. Coll., Brookings, S. D.

Investigations to Determine Control of Storage Rot in Cut Seed Potatoes (10 min.)—J. S. Gardner, Exp. Sta., Lexington, Ky.

A Note on the Variation in Vigor of Sprouts from Quarters of Single Tubers (5 min.) (lantern)—John Bushnell, Exp. Sta., Lexington, Ky.

Note.—Owing to a conflict with the evening program of the American Association for the Advancement of Science, the Secretary of Section O (Agriculture) advises that their dinner is to be postponed from Thursday to Friday evening, December 28. Those who had planned to attend this dinner will please note change.

FORTHCOMING MEETINGS

The annual meeting of The Potato Association of America is to be held at Cincinnati, Ohio, December 27-29, 1923. The first session is scheduled for 10:00 A. M. in Room 204, Engineering Building, University of Cincinnati.

Farmers' Week Annual Potato Show, College of Agriculture, Ithaca, N. Y., February 11 to 16, 1924.

POTATO NOTES

Colorado.— The potato situation of Colorado, as I see it from all of the reports I have been able to get and what I have been able to see personally, is that Colorado will have fully five million bushels of potatoes less than last year's crop. Some of this is due to a shorter acreage, but considerable of it is due to the planting of poor seed affected with mosaic and leaf roll. Very few of our farmers seem to know anything about these diseases, and a hill affected with them produces small potatoes that will go thru the 1¾ or 2-inch screen, and as most of them pick their seed in the spring from the potatoes that have gone thru the screen, they are getting more and more of these diseased potatoes for seed and multiplying the diseases rapidly in their market plots. It has been conclusively proven to those of us who have studied and watched the development of the certified seed during the past few years, that it is imperative that seed plots be established in all of our potato growing districts, and these should be under the supervision of experts who know these diseases and can carefully rogue the seed plots from time to time, saving only the best for the seed plots next year and using the remainder from the seed plots to plant the market fields.

Yesterday's report shows that Russett Burbanks were bringing $2.00 per cwt. in the Chicago market, while Wisconsin, Minnesota and Michigan potatoes were bringing from 90c to $1.20 per cwt., proving to the growers in Colorado and Idaho that they should bend their efforts to improving their Russett Burbank potatoes and carefully grade same so that the premium that they are now getting for these potatoes could be maintained and probably increased. The San Luis Valley shows that they are getting 65c to 70c for their Brown Beauties and 80c to 85c for their Red McClures or Peach Blows and Russett Burbanks. We figure that Colorado has shipped about one-half of what she will ship for this season. Much of these have gone out immature, and the prices paid to the growers have suffered in consequence.

After the disastrous experience of the potato growers in Colorado last spring in sorting their potatoes from the cellars (they had to take out from 15 to 33 1-3 per cent on account of cellar diseases), they should certainly be alive to the necessity of fumigating their cellars and taking better care of their potatoes in storage.

There is now no question but that, if the growers of potatoes of the United States would bend their efforts to improve the quality of this crop, the consumption per capita could be materially increased, thereby helping to stabilize the industry.

It has been conclusively proven that to raise good yields of high quality potatoes, it is necessary to rotate the crops with our legumes of the West, alfalfa or sweet clover, and raise potatoes but one year in four or five on the same acre, plant high quality seed and grade carefully the markets. —***Lou D. Sweet, Denver, Colo.,*** Nov. 27.

Hastings, Fla.—From all information at hand the potato growers in the Hastings district in Florida are planning to plant a larger acreage this winter than last. The Fruit Trade Journal and Produce Record under date of November 17 reports that several carloads of Maine grown certified seed tubers are being distributed for extra early planting in the Federal Point section. —*W. Stuart.*

Chicago, Ill.— On November 19 the writer visited the packing establishment of E. Kahn & Co. for the purpose of observing the methods employed by this company in grading, wrapping, and packing potatoes for hotel, restaurant, and family use. This firm has for many years been engaged in putting up a select grade of baking potatoes for high class hotels and restaurants, in most of the larger cities of the East. Until this year only one size of package was offered to the trade, this being the standard size apple box. The potatoes are sorted according to size. Each tuber is wrapped in tissue paper and each box contains a definite number of tubers. Three sizes are put up 50's, 60's, and 70's, that is, there are 50, 60, or 70 tubers to the box. The boxes average about 56 lbs. of potatoes. This season the E. Kahn & Co. have undertaken the putting up of select potatoes averaging from 8 to 12 ounces in 15 and 30 lb. pasteboard carton packages. The tubers in this case are not wrapped. Each package is guaranteed to contain either 15 or 30 lbs. For convenience of handling the 15 and 30 lb. cartons are put up in crates. Ten of the smaller cartons constitute a crate and five of the larger. Each crate, therefore, whether of the smaller or larger size weighs approximately the same. The company expects to develop a market for these smaller packages through the large retail stores such as "The Fair" and high class grocery stores. It is understood that $25,000.00 is being spent in advertising the advantages to the city consumer in the purchase of selected potatoes put up in a light-excluding package of such size as to permit of its use without deterioration.

The variety being handled at the time of our visit was the Charles Downing, better known as the Idaho Rural, and was grown in Idaho. The firm only buys especially selected stock. Nothing under 8 ounces is wanted. —*W. Stuart.*

Michigan.— The Second Annual Apple and Potato Show was held at Grand Rapids, Mich., Nov. 20-23. Those in charge of the show are to be congratulated upon the size and quality of it. Nearly $900.00 in cash prizes was given for potato premiums and the quality of the entries, most of which were peck samples, showed the results of great effort on the part of H. C. Moore and J. W. Weston of the Agricultural College, and the various county agents and others who have worked with the growers in attaining this high standard. Michigan deserves much credit for commercializing the Russet Rural potato. The principal problem with the Michigan grower is no longer so much that of production, but rather that of finding a steady and profitable market for this variety. Michigan growers are now asking themselves the question of whether to continue to specialize on the Russet rather than the

white Rural. The Russet Rural which originated on the farm of George Priestly of Kalkaska, Michigan, is here and there showing a tendency to revert to the original type. Partially white or entirely white skinned tubers are not an uncommon occurrence in certain strains of Russet Rurals in both Michigan and New York. The writer during the show addressed the Michigan Potato Producers Association on, " Factors Contributing to Potato Progress." The factors discussed were,— increased and more intelligent fertilizer practice; seed improvement in its various phases; better cultural practices; the upward trend of yield per acre; the development of seed potato inspection and certification work; varietal standardization and cooperative marketing. These factors are not considered definite measures of progress, however, unless it can be clearly shown by an upward trend of yield per acre, rather than by an increased total acreage and production, that the grower is finding potato production more profitable than formerly. —*E. V. Hardenburg.*

Michigan.— The Michigan Apple and Potato Show held at Grand Rapids was a big success, the attendance being over 10,000 and the quality of the apple and potato exhibits were especially fine. There were over 250 entries of potatoes and the competition was keen. The general quality of this year's exhibit was much better than that of last year. Dr. E. V. Hardenburg of Cornell University did excellent work in judging at our show. In connection with the show the " Michigan Potato Producers' Association " held two meetings which were rather poorly attended, there being only 50 or so growers present at each session. However, the interest in the program was very good.

On November 7 and 9 we had a big show at Gaylord called the " Top——Michigan Potato Show." This was about the best potato exhibit that I have seen. We held a meeting during the show and there were over 300 growers present. —*H. C. Moore.*

New Jersey.— The annual show and meeting of the New Jersey State Potato Association will be held at Trenton on Thursday and Friday, January 17 and 18.

This year, 430 acres of late crop potatoes were entered for certification, of these 231 acres passed the two field inspections. With the exception of 4 acres of Green Mountains and one of Spaulding Rose, all of the seed passing these two inspections was of the Irish Cobbler variety. The quality of the seed stock is fine as regards tuber diseases and type.

More than ever before the potato grower of central Jersey is undecided as to the variety of potato he will plant in 1924. He has, however, apparently reached the decision that he can no longer afford to plant his entire acreage with the American Giant, which for years has been the most popular variety in central Jersey. Its popularity arose from the fact that it not only out-yielded any other variety but it was considered to be much more resistant to scab. During the past several years, however, there has been a shortage of high grade Giant seed, with the result that in many

cases the variety has failed to crop properly. An even bigger factor has entered, which has been largely instrumental in bringing about the present unsettled condition. It has always been true that the price of the American Giant has lagged behind that of the Irish Cobbler variety. In the past two years this difference in price has become so great as to offset the advantage of the larger yields of the Giant. In August, 1922, the average price paid the grower for Giants was 60 cents per hundred weight, as compared with 78 cents for Cobblers. In September the average price for the two varieties was 53 and 76 cents respectively. This year, in August, the average price received for Giants was $1.76 per hundred weight and for Cobblers $2.33. At one time during August Cobblers were bringing $1.50 per barrel more than Giants, while in September the average price was $1.03 per barrel greater for Cobblers than for Giants. During the past year extensive seed source and variety tests were conducted in the three central Jersey counties. In these tests the average yield of Cobblers was 118.6 bushels and of Giants 138.2 bushels. Based on the average selling price of these two varieties during the month of August the returns per acre from the Cobblers is $166.04 and from the Giants $144.91. A consideration of these figures reveals the reason for the present tendency to discard the Giants as one of the important central Jersey varieties. There is some question concerning the variety to plant to replace the Giant. The present tendency is toward the Irish Cobbler, latest reports indicating that at least 65 per cent of the acreage in the Freehold section next year will be planted with this variety. For a late variety the Green Mountain is probably best for New Jersey conditions. In the seed source and variety tests conducted the past several years, the Green Mountain has consistently outyielded all others included in the tests. The chief objection to this variety lies in the fact that it is much more susceptible to scab than any of the others commonly grown in the state. As a result of this fact, some of the central Jersey growers who find that they cannot grow the Green Mountain with success have turned to the Rural as a promising type of potato for their conditions. Where it was tried out the past year, it yielded well and was quite resistant to scab. This year several cars of Rural Russets were planted by central Jersey growers and the indications are that there will be a considerable increase next year.—***W. H. Martin.***

Brownsville, Texas.— The New York Packer correspondent is authority for the statement in the Nov. 3 issue that on November 2 there were approximately 1500 acres of fall crop potatoes being grown in the Rio Grande Valley, and that the outlook for a spring potato crop is around 4000 acres. This is said to be an increase of 1500 acres over that of last year. The spring crop figure is based on the amount of seed potatoes already purchased by the growers. ***—W. Stuart.***

Virginia.— That the truck farmers of Tidewater Virginia realize the value of high grade, disease free Irish Cobbler seed potatoes,

is shown by the fact that about 30,000 bags of the best stock obtainable have been purchased for planting in the spring of 1924. Of this amount 15,000 bags were secured by the members of the Southern Produce Company, one of the large cooperative organizations in this section. The Eastern Shore of Virginia Produce Exchange and the Farm Bureau have also purchased a large quantity for their members. In most cases certified seed was secured from localities having previously established a record for producing disease free stock capable of giving maximum yields under our local conditions.

Deep interest in the potato seed question was manifest by the growers on the Eastern Shore of Virginia during the Potato Tour on June 6th and 7th, 1923, when the seed demonstration plats were visited. These plats were located on seven different farms in the Counties of Accomac and Northampton. The work was conducted as a joint project of the Virginia Truck Experiment Station, the Extension Division of the Virginia Polytechnic Institute, and the County Farm Bureaus. Extremely wet weather at planting time, followed by a period of prolonged drouth, no doubt influenced the yields on all the plats, and prevented greater differences than might have occurred had there been sufficient rainfall to lengthen the growing period.

The most striking differences occurred between the yields of the mosaic affected and the disease free home grown stock. The mosaic stock was the progeny of plants visibly effected by the disease in the 1922 fall crop and every plant showed evidence of the infection in the spring crop of 1923. The yields from the home grown mosaic plats averaged 43 per cent less primes than that from the disease free home grown lots. The term "Home Grown" refers to seed produced in New Jersey or Virginia as opposed to seed shipped direct from the sections indicated. The average yield per hill of the various lots grown on the demonstration plats in 1923 is given in the following table:

SUMMARY OF YIELDS

Source	Av. yld. per hill Primes Lbs.	Culls Lbs.	Yld. Primes Percent based on av. all plats
New Jersey home grown No. 1	.6686	.1451	129.1
Home grown from Pr. Ed. Isl. stock	.6061	.1321	117.
South Dakota direct	.5841	.1326	112.8
Frostburg, Md., direct	.5767	.1446	111.3
Prince Edward Island direct	.5720	.1341	110.4
Maine certified No. 1	.5226	.2022	100.9
Maine certified No. 2	.5084	.1472	98.1
Maine certified No. 3	.4915	.1355	94.9
New Jersey home grown No. 2	.4818	.0947	93.0
Home grown from Maine stock	.4769	.0901	92.8
Common Maine grown (uncertified)	.4547	.3064	87.7
Home grown (Mosaic diseased)	.2715	.0986	52.4

Note: The average yield of primes per hill for all strains was .5179 pounds. Using this figure as a basis of 100 per cent, six of the strains made a yield above the average and six below.

H. H. Zimmerly, Norfolk, Va.

Wisconsin Notes. — Ten counties in Wisconsin staged exhibits of Wisconsin certified seed and graded table stock at the Wisconsin Products Exposition held in Milwaukee, Dec. 1-8, 1923. The exhibit, according to the prospectus issued by the Wisconsin Potato Growers Association, is intended to direct attention to the development of "potato belts" in Wisconsin, that is, the concentration upon standard varieties grown on a county or community plan based upon adaptability and market requirements. This prospectus further states that 4000 acres were inspected in 1923, and that from this acreage approximately 300,000 bushels of certified seed has been harvested. Two inspections are called for under the Wisconsin plan of seed certification, one field and one bin inspection. The Wisconsin Department of Markets provides for loading point inspection and the State Inspection Service provides the copyrighted "Red Tag" for certified seed shipments under "Badger State Brand" requirements. The following information is given regarding the county exhibits:—Oneida County is concentrating heavily on Green Mountain and Triumph varieties. The Rural New Yorker is also well represented in the certified acreage with a limited amount of Early Ohio. Barron County concentrates especially on the Rural New Yorker. A limited quantity of Triumph and Green Mountain are also grown. In Vilas County the Rural New Yorker and Triumph feature the seed lists. Forest County inspection records show that the Rural New Yorker, Green Mountain, Irish Cobbler and Triumph are represented in the certified seed list. The seed list of Marinette County features Rural New Yorker and Triumph varieties. Price County list shows Triumph, Green Mountain and Rural New Yorker. In Shawano County the Rural New Yorker and Early Ohio are featured. The Taylor County list shows Rural New Yorker and Triumph. Washburn County grows the Rural New Yorker very largely with a limited amount of Triumph. The tenth county is not accounted for in the prospectus although it distinctly states that ten counies are participating.

The potato men are requested to meet at dinner at the Republican House the evening of the fifth at which a report of a special committee arranged by the Wisconsin Certified Seed Potato Inspection Board will be submitted with proposed state plan for marketing the certified seed potato crop of the state. —*W. Stuart.*

PRELIMINARY SEED CERTIFICATION NOTES [1]

Corvallis, Oregon, Oct. 24.— We had about 2000 acres entered for certification this year. The first field inspection disqualified all but about 600 acres, while the second field inspection reduced

the area to 118 acres. These are mostly Netted Gems and Burbanks.— E. R. Dykeman.

Harrisburg, Pa., Oct. 15.— The policy of the certified seed program this year is quality first and quantity in the future. From a total of 1200 acres entered for certification fewer than 300 acres met the rigid requirements of our certified standards. This high percentage of failure to qualify was due mostly to our efforts to certify only such strains as are proving successful under test when used in other parts of the state. If only disease requirements had been considered practically all of the seed would have qualified.

All seed grown this year was from previously certified or approved stock and was rogued by trained men no fewer than four times during the season. Special attention was paid at the last inspection to the eradication of "giant hills."

The north-central seed potato center, consisting of Bradford, Potter, and Sullivan counties will this year produce approximately 250 acres of seed potatoes. The seed produced in this section is divided as follows:— Bradford and Sullivan counties approximately 50 acres and Potter county 200 acres.— C. H. Hadley and W. A. McCubbin.

Montpelier, Vt., Oct. 8.— Of the 652½ acres inspected 474 passed final inspection and were certified. Of this acreage 77 were Irish Cobblers, 393 Green Mountains, and 4 of Russet Rurals.— Harold L. Bailey.

Durham, N. H., Oct. 8.— Fifty-two acres have passed both field inspections out of a total of 58 acres entered for certification. The returns received to date indicate that in general the yield will be above 250 bushels per acre and one of our growers has reported 450 bushels.— O Butler.

Ithaca, N. Y., Oct. 17.— Last year there was a total of [1]375 acres of potatoes in New York State passing all inspections and from this area 304,499 bushels of seed were certified. This year the acreage passing second inspection is 1178.

On the basis of last year's third inspection disqualifications this area will be reduced about 10 per cent. This reduction combined with the predicted poorer yield per acre will mean a reduction below last year's yield of certified seed of approximately 75,000 bushels. Should the third inspection disqualification be less than 10 per cent the reduction in yield will be correspondingly smaller. About 17 1-3 per cent of the acreage entered for certification was disqualified at the first inspection and 8½ per cent of the remainder was disqualified at the second inspection. As a result only those fields most suitable for seed are left for the third inspection.

There has been an increase in the acreage of Irish Cobbler,

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[1]These notes were prepared for the November issue but had to be omitted on account of lack of space. W. S.

Green Mountain, and Spaulding Rose 4 under inspection this year as compared with last year, while there has been a decrease in the Rural and American Giant.

The certified seed stock offered by New York growers this year should be exceptionally good, if well graded, as great care has been taken to exclude all fields that do not qualify exactly to the new standards. The growers are also taking more interest in improving their stock through seed selection, maintenance of seed plots, and roguing, or through the purchase of improved stock. — M. F. Barrus.

Raleigh, N. C., Oct. 2.— Four inspections are made before certification tags are issued — at blossoming time, during July, at digging time, and in the bin before shipment. Potatoes which cannot be certified but which come within certain disease requirements are recommended as good seed. Applications received for 98 acres; 56 acres passed first three inspections; 12½ acres dug and sold before third inspection.— R. F. Payne.

Columbus, Ohio, Oct. 13.— We have 150 acres under inspection, 101 of which have passed the first two inspections.— N. W. Glimes.

Nebraska, Dec. 1.— The bin inspection of the certified seed lots has just been completed in western Nebraska. About 200,000 bushels of potatoes are being certified. Of these about 190,000 bushels will be for sale. All of the stock certified is of the Triumph variety with the exception of about 2,000 bushels of the Early Ohio variety. Yields per acre have been unusually high because of the unusually large amount of rainfall throughout the entire growing season. Definite acreage computations have not yet been made. Probably 40 per cent of the original 5800 acres entered, were accepted for certification. Most growers will need to sort out a very high percentage of the potatoes in order to meet the requirements of the standard U. S. No. 1 grade. The defects are mostly large, cut and knobby potatoes with a considerable amount of scab in some fields. A number of fields were rejected because of frost injury visible as frost necrosis.

One concern that raised 69,000 bushels of certified seed shipped all of the stock, at digging time, to cold storage in Kansas City. These potatoes were sorted in a warehouse as they were brought from the field. They reached cold storage about 8 to 10 days after being dug.

The prices being paid for certified seed potatoes are not as high as those received a year ago. The 1922 Nebraska certified seed potato crop was sold at an average price of about $1.90 per cwt. Thus far this season sales have ranged from $1.25 per cwt. for October delivery to $3.00 per hundred for February delivery. The prevailing price has probably been between $1.50 to $1.75 per cwt. for December delivery. About 10 to 15 per cent of the certified crop has already been shipped.— H. O. Werner.

ANONYMOUS — The potato crop.— Monthly Agr. Rpt. Ministry of Agr. of Grt. Britain, Nov. 1, 1923. According to this report the potato crop in the Midlands, East and South of England was about three-fourths harvested, but in the North and in Wales the weather was very unfavorable and the crop is being stored in dirty condition. The quality is reported as fairly good but the tubers are said to be generally small. In Wales the crop has deteriorated considerably owing to the wet, and many tubers are rotting in the ground. The yield per acre is estimated at 5.7 tons (211 bu.) or half a ton less than the ten year average and nearly 1½ tons less than in 1922. The total production in England and Wales is estimated at 2,667,000 tons (2,240 lbs. per ton) against 4,012,000 in 1922, and 3,160,000 tons for the ten year average. —*W. Stuart.*

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ANONYMOUS — Advises candling potatoes — The Red River Valley potato growers were recently advised by Professor Hyslop that it was possible to candle their potato tubers for hollow hearts in the same manner as eggs are examined to determined their condition. It is claimed that hollow hearted potatoes as well as those with interior discolorations do not transmit light readily, while perfect specimens will do so.

ANONYMOUS — Crop prospects.— Potatoes.— Foreign Crops and Markets (U. S. Dept. Agr.) 7:274-275, Oct. 10, 1923. In countries reported to date for 1923 the potato crop is about 79 per cent of that of 1922.

Germany is the world's greatest producer of potatoes, 1,200,000,000 bushels, as compared with 1,494,181,000 bushels in 1922. Poland ranks second with an estimated production of 896,000,000 as against 1,220,576,000 bushels in 1922. The production of 15 countries of the northern hemisphere reporting for 1923 is 3,089,036,000 bushels as compared with 3,900,730,000 bushels in 1922. During the pre-war period imports of potatoes into the United States amounted to 3,658,000 bushels. In 1922 the quantity shipped from foreign countries amounted to only 1,775,000 bushels. Cuba is the principal market for American potatoes, taking over 60 per cent of our exports. The Netherlands ranks first as an exporter of potatoes, supplying at least 25 per cent of the world's total exports. In 1922 Italy exported 5,000,000 bushels, Canada 4,000,000 bushels, and Denmark 2,000,000 bushels.—*W. Stuart*

M. HOAD — Growing potatoes for competition.— Popular Gard. 25:649, Nov. 3, 1923. The author gives a list of the winners of each competition during the past seven years. Each competitor was furnished one pound of seed potatoes and usually there were from 350 to 400 competitors each year. The yield in 1917 was 153 lbs.; 1918, 293 lbs.; 1919, 96 lbs.; 1920, 235 lbs.; 1921, 328 lbs.; 1922, 291 lbs.; 1923, 278.5 lbs.—*W. Stuart.*

DONALD FOLSOM — Potato spindletuber.— Maine Agr. Exp. Sta. Bul. 312, pp. 21-44, August, 1923. This is a degeneration disease which is one of the causes of poor tuber shape. Tuber per-

petuation, transmission by aphids and other means, natural spread in the field, and the symptoms in several varieties, are discussed. This disease is prevalent in many potato-growing regions of the country, and is not new except as to name and knowledge of its communicability. —*Donald Folsom.*

WM. H. MARTIN — Late blight of potatoes and the weather.— N. J. Agr. Exp. Sta. Bul. 384, pp. 1-23, 1923. Late blight of potatoes was first reported in New Jersey in 1889, and since that time has been reported as being present in 18 years. Results of a correlation of weather conditions with outbreaks of late blight show a close relationship between the two. Temperature and rainfall were both found to be important in determining the presence or absence of the disease but the influence of one is limited by the other. A correlation of these combined factors with the appearance of late blight indicate that when the July temperature was below the average for the month (73.7° F) and the rainfall above the average (5.02 in.) epidemics of late blight were experienced every year. With approximately the same rainfall range but with the temperature above the average, the disease was reported in two years out of five, in one of the two years only one report of late blight was recorded, and, while the disease was severe in the other, the temperature in that year was only slightly above the average and the rainfall was the heaviest in the thirty-four years considered. In those years when the July temperature was above and rainfall below the average for the month, late blight was experienced in only one year out of 10; however, in the years when the month of July showed approximately the same rainfall but with the temperature below the average, blight was reported as being present in four years out of six. The data at hand indicates that in New Jersey when the temperature for the month of July is below 74° F. and the rainfall above 4.74 inches, conditions are produced that are likely to result in an epidemic of late blight. —*W. H. M.*

NOTES ON RECENT LITERATURE

WM. H. MARTIN — Ten years of potato spraying in New Jersey.— N. J. Agr. Exp. Sta. Bul. 383, pp. 1-32, 1923. Spraying tests conducted with the Irish Cobbler over a period of ten years gave an average increase of 28.2 bushels per acre. In tests conducted since 1919 the average increase was 42.6 bushels. Late blight was not a factor in any of these tests. No yield increases were obtained from spraying the American Giant variety when late blight was not present. In one test where this disease was a factor, however, an increase of 69.4 bushels per acre was recorded. In spraying tests with the late crop grown for seed, an average increase of 33 bushels per acre resulted. A 5-5-50 Bordeaux mixture gave better results than weaker mixtures and the home-made Bordeaux proved to be superior to both commercial Bordeaux

mixture and copper-lime dust. Bordeaux mixture prepared with stone-lime was more effective than that prepared with hydrated lime. Recommendations are given concerning the number of applications necessary for the early and late varieties as well as the time of application—*W. H. M.*

G. R. McINTOSH — Potato crop report.— Dept. Agr. Fruit Branch, Ottawa, Can., pp. 1-13, Nov., 1923. The 1923 Canadian potato acreage is reported by Commissioner of Agriculture McIntosh to be considerably less than in 1922. In some Provinces the yield per acre has also been less. The Provinces of Manitoba and New Brunswick are reported to be importing potatoes. The apparent shortage has resulted in price stimulation as judged by the average wholesale price of $1.42 per cwt. in Canada as compared with $1.05 of last year. Compulsory potato grading is in force in the Provinces and all sales must be made by weight. A brief resume is given of the commercial potato crop in each Province. In British Columbia 19,400 acres were grown in 1923, which produced an average yield of 115.5 cwt. per acre or 192.5 or 215.6 bu. per acre according as to whether the cwt. represents 100 lbs. or 112 lbs. In Alberta 11,225 acres were grown or 25 per cent less than last year, with a yield of 4.5 tons per acre, or 150 to 168 bu. per acre, depending on whether a short or long ton was intended. Saskatchewan grew 50,000 acres, which produced an average yield of 3 tons per acre, 100 or 112.3 bu. per acre. The crop is said to be 35 per cent less than in 1922. Manitoba grew approximately 29,000 acres, as against 35,000 in previous years. Yields of from 25 to 250 bu. per acre are mentioned, but no estimate of total yield is given. In Ontario the potato crop is estimated as about 80 per cent of that of last year. Acreage and yields are given for a number of districts, but no data is given in regard to total yield. Owing to drought in June and July the late potato crop in the Province of Quebec was greatly retarded in growth. No figures are given for the Province as a whole. The acreage in the Lake St. John district is placed at 3200 acres, with an average yield of 60 cwt. per acre. The New Brunswick crop is claimed to be 25 per cent less than in 1922. The total acreage and yield is not given. In the Victoria district the acreage is 10 per cent less than last year. A yield of 100 barrels (275 bu.) per acre is claimed. In the Fredericton district the acreage was only 60 per cent of that of 1922 but the yield was 75 per cent greater. In Prince Edward Island 33,000 acres of table stock were grown with an average yield of 4 tons per acre, 133.3 or 149.3 bu. per acre. The largest acreage was in the Charlottetown district, 31,700 acres of table stock and 3,200 acres of certified seed potatoes. The yield of table stock was 140 bu., as against 200 bu. per acre from the certified seed. Most of the crop is in storage. In Nova Scotia the potato acreage was 70 per cent and the yield 90 per cent of that of 1922. About two-thirds of the potatoes are still in the growers' hands. —*W. Stuart*

NUTTALL, DR. GEO. H. F.—Tuberisation said to be due to the association of the plant with fungi.—Gard. Chron. 74: 273, Nov. 10, 1923. Prof. Nuttall referred to the occurrence of endotrophic mycorrhiza in the roots of species of Solanum and stated that Molliard in experimenting with the potato, found that tubers were not formed in aseptic cultures. Another investigator, Magrou, planted potatoes in a poor soil and found that only when the fungus present on Solanum dulcamara infested the potato plants, were tubers formed. Magrou investigated tuberisation in Orobus tuberosus and in Mercurialis perennis, and stated that when the potato plant and Orobus were raised from seed the establishment of synbiosis leads to tuberisation of the sprouts at the base of the stem, and the tubers are not formed in the absence of symbionts. He further found that in developmental differences between the two plants symbiosis in the potato plant is intermittent, whilst in Orobus it is continuous—*W. Stuart.*

R. N. SALAMAN and J. W. LESLEY—Genetic studies in potatoes; the inheritance of immunity to wart disease.—Journal of Genetics 13: 177-186. August, 1923. Studies of the progenies of both immune and susceptible varieties, selfed and crossed, lead the authors to conclude that immunity to wart disease is dominant to susceptibility. Four types of immune varieties have been distinguished:

(a) Pure immunes
(b) Immunes, which are selfing, give 15 immunes to 1 susceptible
(c) Immunes, which are selfing, give 3 immunes to 1 susceptible
(d) Immunes, which are selfing, give 9 immunes to 7 susceptible

Three kinds of susceptible varieties were found,—those whose susceptibility was due, (a) to the absence of either of the immune factors X or Y, (b) the absence of the complementary factor Z, though either X or Y may be present, (c) the presence of an inhibitor of the immunity factor. Reciprocal crosses showed no difference with respect to immunity and no evidence of linkage between immunity to wart disease and other characters was seen. —*C. F. Clark.*

E. S. SCHULTZ and DONALD FOLSOM.—Transmission, variation, and control of certain degeneration diseases of Irish potatoes.—Journal Agri. Res. 25:43-117. July 14, 1923. The authors point out that these diseases, the causes of which are not yet known, require special methods, including transmission in the same standard variety. Seven diseases have been distinguished and transmitted in Green Mountains, and are described, namely, mild mosaic, leafrolling mosaic, rugose mosaic, streak, leaf roll, spindle-tuber, and unmottled curly-dwarf. Intervarietal and interspecific transmission, tuber perpetuation, varietal and climatic modification of symptoms, and spreading in the field, were observed. The former explanation of running-out or degeneration on the basis of senescence is questioned, and on the basis of climate is thought to have been incomplete considering the indirect effect of climate

upon degeneration diseases through differences in insects and varietal adaptability. The degeneration problem is considered to need study in each potato region because of results in one region not being entirely applicable to another.—*Donald Folsom.*

CERTIFIED SEED POTATO BUSINESS IS CHANGING

J. M. HURLEY, *Sec'y.*

New York Seed Improvement Co-operative Association, Syracuse, N. Y.

In the development of the certified seed potato business in the eastern United States during the past eight or nine years, some significant changes have taken place, both in production and marketing. In the beginning most of the certified seed producers were small growers primarily interested in seed improvement. We still have these same farmers growing seed and many of them have continued to grow only the limited acreage, the details of which they can give their personal attention. But along with them have come a group of seed producers who do not pretend to be more than propagators of the foundation stock they buy from other producers who are doing the real seed improvement work. In the interest of economy in large scale production, this seems to be a good and necessary development.

The source and volume of the demand for certified seed has also been changing. As recently as five years ago, practically the only outlet for certified seed was those southern potato producing sections which had long been buying most of their seed in the north. These are still the largest certified seed markets. But the limit of their possible consumption will be reached when they import only certified seed. In certain sections that desirable end is already in sight.

Very recently potato growers have come to realize that while it is true that some sections can produce good seed potatoes and some cannot, there is no section where poor seed will not and does not now grow. Commercial potato growers thruout the northern United States are coming to realize that the boarder cow and the slacker hen have their parallel in diseased or degenerate strains of seed potatoes grown on many farms even in good seed producting sections. The extent of this new demand may be measured by the experience of New York seed growers in 1922. The New York Co-operative Seed Potato Association, thru its pool, sold certified seed in fifty-four New York counties. The total sold upstate exceeded the quantity shipped to Long Island which was the first large market to be opened to certified seed. Since most of the certified Green Mountains in the state were sold thru the pool and since it is this variety that is chiefly demanded on Long Island, it is probably safe to say that taking all varieties into account, half of all the certified seed grown in New York state is used by upstate growers. A similar develop-

ment is taking place in Maine and Michigan and the other potato states. There is practically no limit to the potential demand for certified seed potatoes from this class of trade. Here in New York we have about 180,000 potato growers and a moment's reflection will convince one that not all of them need buy a large quantity or new supply each year to use a lot more certified seed than we have ever had to offer. As certified seed growers, we are persuading them to stock up with certified seed as often as practicable.

DO PLANT LICE WORK SUBTERRANEOUSLY DURING EXTREME DROUTH?

H. J. WHEELER, *Boston, Mass.*

Two or three years ago the writer noticed a field of potatoes on a gravelly loam soil, which was suffereing seriously from drouth in which occasional hills were lying flat on the ground, suggestive of a possible attack from wilt. Upon examination, it was found that the stalks under ground were surrounded by masses of aphids which apparently had deserted the foliage because of the dearth of moisture, and had punctured the stalk under the ground in their search for plant juices to such an extent that the stalks were literally lying flat on the ground. Is this the explanation, or are there certain forms of plant lice which feed only on the roots under ground? If so, they apparently do no appreciable damage during moist seasons, nor has the writer ever found them when the foliage was sufficiently supported by soil moisture.

It would be interesting to know whether other similar observations have been made and what our entomological friends have to say concerning it.

LATE POTATOES IN MARYLAND 1923

By Thomas H. White

For more than two decades the McCormick variety of potatoes has been a wonderful stimulus to the production of late potatoes in Maryland. Before the advent of this variety a late crop of potatoes was planted only in a limited way. The main reason for this was the poor chance for securing a stand. Planted in midsummer when the soil is warm no other known variety could be expected to make a full stand, and under average conditions the gaps in the fields would be so great as to make the crop not profitable. The variety McCormick changed all this. On the average full stands were secured, even when growers followed the common practice of cutting the tuber into very small seed pieces. Alas, however, evil has befallen it. The mosaic disease is sapping out its existence and unless something is done it will doubtless disappear. Since some investigations by Garner and Allard, the experts on the light stimulus to plant growth, of the U. S. Dept. of Agriculture, there seems to be an explanation of the reason why

this variety was restricted, for best results, to certain localities. It seemed to do well in all the lower counties of Maryland. Also in Virginia under the name of "Hoosier" and in Georgia as "Lookout Mountain." It did not do well in the western counties of Maryland, in the higher altitudes, nor in New York State. Garner and Allard found in their investigations that when subjected to a daylight period of more than thirteen hours, the McCormick made vegetative growth rather than tubers. For this reason, then, it would seem quite necessary for the season to be open as long as possible after the days begin to have a length of thirteen hours. In this latitude the thirteen hour day starts in about the first of September. If tubers commence to form then there would be about six weeks before frost for them to develop. In the higher altitudes frost is liable to kill the vines in from two to three weeks after the shorter day begins. Blight is also prevalent in the higher levels and McCormick seemed quite susceptible to it.

Growers are looking around for another variety to take its place. Some are getting good crops of Russett Rurals, Gold Coin, etc. These, however, cannot be planted as generally as the McCormick. The McCormick can be depended upon to produce some tubers on quite poor and unfertile soil. The other varieties mentioned, presumably on account of a more delicate root system, must have rich soil or they will perish in their youth. So, in the case of these more aristocratic varieties, they are mostly being planted near the larger cities where the soil is rich and cold storage facilities are handy. They are best planted about the first to the middle of July, for if kept in ordinary storage they grow and wilt so badly as to be very susceptible to rot when placed in the ground. Whole potatoes usually come up well, but it is best to put these on cold storage so that sprouting may be retarded.

The Michigan Russett Rurals have been tried here for a couple of seasons. In 1922 two out of four lots planted gave good yields. In the case of the other two lots, the stand of one was so poor that the man plowed them up and the other was only about twenty-five per cent of a stand. This man cultivated them and harvested some very nice stock in the fall.

There are two other varieties that are being grown quite extensively, one called "Dakota Red", "Eastern Shore Red", "German Red", or "Crimson Beauty", depending upon the county in which it is grown, and the other "White Star" or "Scotch Rural". The former is popular in the rural districts, because it will grow well if kept in ordinary storage until midsummer, and also has the same characteristics as the McCormick with regard to carrying good healthy foliage until frost kills it in the late fall. The "White Star" variety must be kept on cold storage if large tubers are to be cut and planted. This is a large sized and strong growing variety of longish oval shape, very shallow eyes and the skin is a bright straw color. The vines are large and vigorous and the blossoms are deep lilac in color. Without the means of verification it would seem to be the same as "Bull Moose".

The mosaic disease has loomed big in Maryland this year. Not only has it almost ruined the McCormick, but also is has got our early potato growers guessing as to where to get good Irish Cobbler for early planting. Some of the most enthusiastic planters of certified seed are troubled to know what to do this season because seed bought on the open market at a reduced price last year showed less mosaic than the certified seed. Some good Irish Cobbler seed has been coming from the Western Maryland seed growing section, but the quantity is limited. Growers there seem to find it more profitable to grow varieties that are heavier yielders and sell them for table stock.

The Maryland Agricultural Experiment Station is planning the coming season, to try and get rid of the mosaic disease in some of the McCormick stock. About the best stock in the State at present has ten per cent of this disease. This trouble was first noticed as a serious problem here during the season of 1918. Since that time it has spread all over the State and shows up worst in the McCormick, although all the other varieties are more or less susceptible.

This season the crop of early potatoes in the middle section of the State was quite light, and on the lower Easten Shore and the upper counties, fair. Late potatoes where not badly injured by mosaic made a good crop. While the rainfall was comparatively light it seemed to fall at the right intervals so that the crop continued to grow.

In a two years test of different dates of planting the late crop, in three sections of the State, August first seems to be too late as the yields are poorest from this planting. In Prince George County last year the June 15 planting yielded the best, but this year July 2nd and July 16 were better. Growers usually plant first and second week in July except on the lower part of the Eastern Shore, where planting is often delayed until August 1st.

THE POTATO INDUSTRY IN BRITISH COLUMBIA

By C. Tice, Dept. of Agriculture, Victoria, B. C.

In presenting a paper or giving an address on any agricultural topic which concerns a particular province or state it is a good idea, first of all to give the audience a brief review of its physical features, so that those present may be able to better understand the conditions which have to be faced.

The province of British Columbia comprises an area of 388,263 square miles with a population of 550,000. It is bounded on the south by the Strait of Juan de Fuca and the 49th parallel of north latitude being the international boundary between Canada and the United States; on the east by the summit of the Rocky Mountains and the 120th meridian of longitude west of Greenwich, on the north by the 60th parallel of north latitude, and on the west by Alaska and the Pacific Ocean.

The main topographical features are the series of high parallel mountain ranges and alternating valleys with a general northwest trend at each side of the province, separated by a lower central belt of plateau and minor ranges and groups.

About 70 per cent of the province drains to the Pacific through such rivers as the Columbia, Fraser, Skeena and Stikene with their tributaries and other minor rivers flowing directly into the sea.

British Columbia has a coast line of approximately 4,400 miles (exclusive of all islands). The coast is buttressed by innumerable islands, the largest of which is Vanvouver Island, which is 285 miles in length, with an average width of 45 miles, comprising an area of 13,500 square miles.

Coming to the subject of this paper, namely, "The Potato Industry in British Columbia," we will first consider production. Statistics published by the Dominion Department of Agriculture at Ottawa, show that for the years 1912 to 1918 the average acre yield of 207.6 bushels in this province was higher than that obtained in any other province of Canada. On comparing this yield with the average for the Dominion during the same period we find it is 39.6 bushels higher. In fact the acre yield in British Columbia compares favorably with that obtained in the leading potato sections of the world. On the other hand the average acreage planted to potatoes in this province is the smallest of any province in Canada, being approximately 16,000 acres. In comparison, however, with other crops grown in British Columbia potatoes hold their own. Hay and clover, oats and spring wheat alone excel potatoes in acreage. The number of bushels produced per capita is approximately eight as compared with twelve bushels per capita for the Dominion.

The total average annual production in British Columbia is approximately 3,500,000 bushels. Deducting 30 per cent of the total crop for cull or unsaleable stock, diseased and frozen tubers, storage shrinkage and seed for the following year's crop leaves 2,450,000 bushels available for consumption. The average annual consumption I have estimated at 1,500,000 bushels, consequently there is a surplus stock in an average year of 950,000 bushels, or 2,855 tons, for which an outlet must be found.

The province of British Columbia is generally considered to be well adapted for the production of large yields of high quality potatoes for several reasons:—

(1) Much of the land is new, of a sandy nature, and in a high state of fertility.

(2) Favorable climatic conditions exist here.

(3) Late blight is only found in one section of the province.

(4) Leaf-roll and mosaic diseases, although prevalent, are not as serious here as in other parts of the North American continent.

(5) The Colorado potato beetle has not yet reached the potato growing sections of the province.

In turning our attention to climate we find that owing to the

mountainous character of much of the province and its great range in latitude the climate naturally varies greatly accordingly to local conditions. Along the Pacific seaboard the climate during the winter months is remarkably mild and the rainfall is considerable. During the summer months the ever changing tidal waters tend to keep the day temperature moderate while the nights are usually cool. For this reason, it may be said that climatic conditions in British Columbia are almost ideal on the coast for potato growing. One drawback, however, is that rainfall is light particularly in the southern part of Vancouver Island during the summer months.

Passing inland to the eastern side of the mainland coast mountains much greater ranges in temperature prevail between summer and winter and considerably less precipitation occurs, while in some districts it is so light that dry belts exist and irrigation is necessary. Owing to the mountainous character of much of the interior, climatic conditions here are of various types. In the southern interior and the Kootenays the summer temperatures are high, while in winter the temperatures do not fall much below zero.

In the central and northern interior and Peace River the winters are clear and cold, while in the summer sufficient rain falls to ensure luxuriant growth. Summer frosts are also experienced in various parts of these districts, but with clearing, cultivation and drainage these rapidly disappear.

The chief potato producing sections of the province at the present time are Lillooet, Ashcroft, Kamloops, Armstrong and Vernon in the interior and the Fraser Valley. In the interior, as has already been explained, the rainfall is very light and irrigation has to be practised. The industry in this part of the country is almost entirely in the hands of Orientals. The chief varieties being grown are Netted Gem and Burbank, although generally the varieties are very much mixed. The Oriental as a rule pays little attention to the kind of seed he plants. In the Fraser Valley the rainfall is considerably higher; consequently there is sufficient moisture present and irrigation is not necessary. Here again a large quantity of the potatoes are grown by Orientals, and the varieties are very badly mixed. I am glad to say that the white growers are beginning to pay more attention to their seed with the result that large quantities of pure seed are available annually, and every effort is being made to encourage the public to use this seed.

On Vancouvr Island the production of potatoes is steadily increasing and more interest generally is being taken in the crop; the same applies to the Windermere, Grand Forks and other districts in the Kootenays. In the latter districts irrigation is necessary, and it is only recently that it has been possible for the farmers to obtain the water for such purposes.

(To be continued)